

## Accepted Manuscript

Green carbon nanostructured quantum resistive sensors to detect volatile biomarkers

K.M. Tripathi, A. Sachan, M. Castro, V. Choudhary, S.K. Sonkar, J.F. Feller



PII: S2214-9937(17)30063-5  
DOI: doi:[10.1016/j.susmat.2018.01.001](https://doi.org/10.1016/j.susmat.2018.01.001)  
Reference: SUSMAT 54

To appear in: *Sustainable Materials and Technologies*

Received date: 23 May 2017  
Revised date: 14 September 2017  
Accepted date: 10 January 2018

Please cite this article as: K.M. Tripathi, A. Sachan, M. Castro, V. Choudhary, S.K. Sonkar, J.F. Feller , Green carbon nanostructured quantum resistive sensors to detect volatile biomarkers. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. *Susmat*(2017), doi:[10.1016/j.susmat.2018.01.001](https://doi.org/10.1016/j.susmat.2018.01.001)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

# Green carbon nanostructured quantum resistive sensors to detect volatile biomarkers

K. M. Tripathi<sup>a</sup>, A. Sachan<sup>ab</sup>, M. Castro<sup>a</sup>, V. Choudhary<sup>b</sup>, S. K. Sonkar<sup>c</sup>, J. F. Feller<sup>a\*</sup>

<sup>a</sup> Smart Plastics Group, Bretagne Loire University (UBL), IRDL CNRS 3744 - UBS Lorient, France

<sup>b</sup> Centre for Polymer Science and Engineering, Indian Institute of Technology (IIT), Delhi, India

<sup>c</sup> Department of Chemistry, Malaviya National Institute of Technology, Jaipur, India.

\*corresponding author: jean-francois.feller@univ-ubs.fr

**Abstract.** Sensing volatile organic compounds (VOC) is a promising approach in particular for the development of non-invasive, fast and inexpensive tool for the anticipated diagnostic of diseases and monitoring of exposition to toxic molecules. This paper examines for the first time the potential of biobased carbon nanorods (CNR), synthesized by a simple and green method in gram scale via the pyrolysis of castor oil, to build the conducting architecture of quantum resistive vapour sensors (vQRS). The transducers are nanostructured by spraying layer by layer (sLbL) carbon nanorods (CNR) completely free from any metallic contaminants or other impurities. Then they are functionalized with poly(lactic acid) PLA and poly(vinyl acetate) PVA to providing a set of three vQRS with distinct selectivities towards VOC, selected among lung biomarkers. The discrimination ability of an array (e-noses) composed of three CNR based vQRS has been demonstrated. It is found in particular that CNR native sensitivity to cyclohexanone can be modified by PLA that brings a larger selectivity

Download English Version:

<https://daneshyari.com/en/article/7228338>

Download Persian Version:

<https://daneshyari.com/article/7228338>

[Daneshyari.com](https://daneshyari.com)